

REMARKS

The Office Action has been carefully reviewed. Reconsideration and allowance of the claims in light of the foregoing amendments is respectfully requested. A petition and fee for a three-month extension of time is submitted herewith.

Initially, the Office Action noted that restriction to one of the following inventions had been required under 35 U.S.C. 121:

- I. Claims 1-13, drawn to an electropolishing process, classified in class 205, subclass 640.
- II. Claims 14-19, drawn to a template article, classified in class 428, subclass 615.

The inventions are distinct, each from the other because of the following reasons:

Applicants had made a provisional election with traverse to prosecute the invention of group 1, claims 1-13. Applicants hereby affirm the earlier telephonic election of group 1, claims 1-13 and withdraw the traversal.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Claims 14-19 stand withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim 2 was objected to because of the following informalities: "ia" in lines 2 should be --is--. Appropriate correction is required.

As applicants have amended claim 1 to include the limitations of claim 2 and cancelled claim 2, this rejection is now moot.

Claims 1-8 and 11 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Qiao (provisional application 60/483956 of U.S. Pat. Pub. 2005/0000826 A1) in view of Datta et al. (U.S. Pat. 6,228,246 B1) and Rosswag (U.S. Pat. 4,372,831). The Office Action noted that with respect to filing dates of Qiao, the non-provisional application was filed on 28 June 2004 and the provisional application was filed on 1 July 2003. All references to Qiao refer to the disclosure in the provisional application.

Regarding claim 1, Qiao discloses (Fig. 1A, page 1 paragraphs 2-3) a continuous process of providing a highly smooth surface to a metallic tape, the process comprising:

passing a metallic tape having an initial roughness through a bath contained within a polishing section of an electropolishing unit over an inherently pre-selected period of time; and passing a current through the metallic tape during the period of time the metallic tape is in the bath whereby the roughness of the metallic tape is reduced. Qiao does not specify that the bath would contain acid and does not specify the current density applied.

With respect to the limitation of the bath containing an acid in claim 1, Datta et al. teach (col. 3 lines 49-65) that electropolishing baths contain acid in order to dissolve and transport the ionic species formed by the electric current. It would have been obvious to one of ordinary skill in the art to combine acid with the electropolishing bath of Qiao in order to dissolve and transport the ionic species formed by electric current as taught by Datta et al.

With respect to the limitation of mean surface current density of at least 0.18 amperes per square centimeter in claim 1, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to electropolish at the desired current density by a routine optimization in order to obtain the desired finish. See MPEP 2144.05 II.

Regarding claim 2, Qiao does not specify that the initial RMS roughness would be more than about 10 nm and that the reduced RMS roughness would be less than about 4 nm. The Examiner asserts that prior to polishing the initial RMS roughness of the tape would be more than 10 nm since the tape would not yet have been polished. Also, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at higher current densities. It would have been obvious to one of ordinary skill in the art at the time of the claimed invention to combine higher current densities with the electropolishing process of Qiao in order to obtain a mirror gloss finish as taught by Rosswag. See MPEP 2144.05 II. Furthermore, the Examiner asserts that a mirror gloss finish would inherently have a reduced RMS roughness of less than about 4 nm.

Regarding claim 3, Qiao does not specify the current density applied and does not specify a reduced RMS roughness of less than about 0.5 nm. Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and

that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to electropolish at the desired higher current densities by a routine optimization in order to obtain the desired mirror finish. See MPEP 2144.05 II. Furthermore, the Examiner asserts that a mirror gloss finish should inherently have a reduced RMS roughness of less than about 0.5 nm.

Regarding claim 4, Qiao does not specify a reduced RMS roughness of less than about 0.5 nm. However, Rosswag teaches (col. 3 lines 26-30) that industrial gloss would be obtained at lower current densities and that mirror gloss would be obtained at higher current densities. Since current density is a result-effective variable as taught by Rosswag, it would have been obvious to one of ordinary skill in the art at the time of the claimed invention to electropolish at the desired higher current densities by a routine optimization in order to obtain the desired mirror finish. See MPEP 2144.05 II. Furthermore, the Examiner asserts that a mirror gloss finish would inherently have a reduced RMS roughness of less than about 05 nm.

Regarding claim 7, Qiao do not disclose that the metallic tape would be a single crystal, therefore the tape would be polycrystalline.

Regarding claim 8, Qiao disclose (page 4 paragraph 2) that the metal can be a nickel alloy.

Regarding claim 13, Qiao disclose (fig. 1A and page 3 paragraph 3) that the metallic tape is passed through the bath and the bath provides electrical contact with the metallic tape.

Applicants have submitted a declaration of prior invention under 37 C.F.R. 1.131 to overcome the Qiao reference. All the inventors except Sasha Kreiskott have executed the declaration. Sasha Kreiscott has left the country and was unavailable to sign the declaration. It is submitted that this excuse or explanation should be acceptable in view of all the remaining co-inventors and co-authors signatures.

The present invention was completed prior to the date of publication in the journal Superconductor Science and Technology on April 10, 2003. Accordingly, the Qiao reference is overcome and the rejection of claims 1-8 and 11 under 35 U.S.C. 103(a) as being unpatentable over Qiao in view of Datta et al. and Rosswag is urged to be withdrawn.

Claims 1, 5, 7 and 9-13 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Andreshak et al. (U.S. 5,066,370). The Office Action stated that regarding claim 1, Andreshak et al. disclose (Fig. 1, col. 1 lines 8-15, col. 9 lines 1-21) a process of providing a microfinished surface to a metallic strip, the process comprising: passing a metallic strip having an initial roughness through an acid bath contained within a polishing section of an electropolishing unit over an inherently pre-selected period of time; and passing a mean surface current density of between 0.5 and 2 amperes per square centimeter through the metallic tape during the period of time the metallic tape is in the acid bath whereby the roughness of the metallic tape is reduced. Andreshak et al. do not specify that the process can be made continuous and do not use the word "tape" to describe the strip.

With respect to the limitation of "tape" in claim 1, the Meriam-Webster Online Dictionary defines tape as "a narrow flexible strip or band". Andreshak et al. disclose (col. 1 lines 6-15) that the metallic workpiece would be a strip or band and in Fig. 1 disclose that the strip or band would be flexible.

Regarding claim 5, Andreshak et al. disclose (col. 9 lines 1-21) that the acid bath would include a mixture of sulfuric and phosphoric acid.

Regarding claim 7, Andreshak et al. do not disclose the metallic strips would be single crystals therefore the metallic strip would be polycrystalline metal.

Regarding claim 9, Andreshak et al. disclose (see Fig. 1, col. 5 lines 43-66, col. 9 lines 1-21) that the metallic strip would be in direct electrical contact with an anode (24) in said electropolishing unit while said metallic strip would be within an electrically conductive liquid throughout said electropolishing unit and within said acid bath in said polishing section, said acid bath further in contact with a cathode in said electropolishing unit so as to complete an electrical circuit.

Regarding claim 10, Andreshak et al. do not specify the composition of the electrical connection (24) to the metallic strip. The Examiner takes official notice that silver has a high conductivity. It would have been obvious to one of ordinary skill in the art to modify the electrical connection (24) to the metallic strip of Andreshak et al. by making the electrical connection out of silver in order to have high conductivity.

Regarding claim 11, Andreshak et al. disclose (col. 9 lines 1-21) that the acid bath would include a mixture of sulfuric and phosphoric acid.

Regarding claim 12, Andreshak et al. disclose (see Fig. 1, col. 5 lines 43-66, col. 9 lines 1-21) that the metallic strip would be in direct electrical contact with an anode (24) in said electropolishing unit while said metallic strip would be in contact with mechanical contact (14, 16, 18 and 20) as the metallic strip is passed through the acid bath so as to complete an electrical circuit.

Regarding claim 13, Andreshak et al. disclose (abstract and Fig. 1) that the metallic tape is polished in the acid bath, therefore the acid bath would provide electrical contract with the metallic tape.

Applicants have amended claim 1 to include the limitations of claim 2 (which has now been cancelled). Accordingly, as claim 2 was not rejected as being unpatentable over Andreshak et al., amended claim 1 and claims 5, 7 and 9-13, all dependent directly or indirectly from claim 1 are now urged to be allowable.

In view of the foregoing amendments and remarks, claims 1, 3-5 and 7-13 are urged to be allowable over 35 U.S.C. 103. If the Examiner believes there are any unresolved issues despite this amendment, the Examiner is urged to contact the applicants' attorney undersigned below for a telephonic interview to resolve any such issue. A favorable action is solicited.

Respectfully submitted,

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